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15 YEARS OF SPACE EXPLORATION AND BEYOND

By Dr. James C. Fletcher  
Administrator

Because it is so much a part of our lives, perhaps we are not fully aware that we are living in the Space Age.

The United States formally entered the Space Age 15 years ago on Oct. 1 when NASA was established by the National Aeronautics and Space Act of 1958.

This is a remarkable document. It establishes a government research and development agency, NASA, and declares "it is the policy of the United States that activities in space should be devoted to peaceful purposes for the benefit of all mankind."

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To this end, NASA is charged with developing and improving aircraft and space vehicles and gathering the information for the exploration of the atmosphere and space. The agency also has the responsibility to carry out these ventures in cooperation with other nations and with other agencies of the U.S. Government.

The mandates of the Space Act are open-ended. The completion of any mission, such as landing a man on the Moon, does not end the agency's responsibility. In fact each new accomplishment opens new goals for research and development and points to new paths to follow "for the benefit of all mankind."

Fifteen years ago the U.S. was caught up in the excitement of Sputnik and the concern that we were falling behind the USSR in technological achievements.

Those early days were devoted largely to scientific satellites and to developing the engineering needed to assure their success. We were learning in those days. In 1959, the first full year of operation of the agency, we had eight successes and six failures. In 1972, the last full year of operation, NASA chalked up a perfect record of 18 straight flawless launches.

When President Kennedy announced the decision for manned exploration of the Moon, the agency took a new direction. Much of its energies were turned to this mission, and enormous amounts of scientific data were returned and technology developed.

It is important to note, too, that the Apollo missions, especially the spectacular Apollo 11 which landed the first men on the Moon, captured the imagination of the world and gave Americans new confidence in themselves.

With this confidence came acceptance of the nation's ability to perform in space. This, coupled with pressures from other national priorities, resulted in a reorientation toward developing a comprehensive program for reaping the benefits of space.

Benefits have been accruing from the exploration of space throughout the last 15 years.

First, there are the continuing and long term benefits of space science and exploration. These are difficult to define but are nevertheless real. Today we are making practical use of scientific research conducted 30 to 50 years ago. In the same way, we can be sure that 30 to 50 years from now our children will be making practical use of the results of the science and exploration we are doing today. For example, weather patterns on Venus may give us a vital missing link to understanding global weather patterns on Earth.

Second, our work produces direct applications of aeronautical and space technology and systems. These include improvements in civil and military aircraft resulting from our aeronautical research and development, improvements in communications and weather forecasting from the use of satellites, and benefits in many fields that will be obtained through the use of Earth resources satellites.

Third, benefits to the economy result from NASA's program. One study indicates that a dollar invested in research and development returns more than seven dollars to the economic mainstream over an 18-year period. Furthermore, we increase our productivity through advanced technology and thus improve our competitive position with overseas firms.

Finally, there are the technology transfers -- non-aerospace applications of aerospace technology -- which flow from NASA programs. Many of these indirect benefits occur through the spread of technical information in conferences and meetings of professional and trade associations or through technical reports and publications. Others occur through the NASA Technology Utilization program, specifically designed to encourage the widespread use of NASA technology in all segments of the economy.

In putting space research to work in everyday life, NASA works with many government agencies. The list includes the Department of Agriculture, the Atomic Energy Commission, the Department of Commerce, the Department of Defense, the Environmental Protection Agency, the Government Services Administration, the Department of Health, Education and Welfare, the Department of Housing and Urban Development, the Department of the Interior, the Department of Justice, the Department of State, the Department of Transportation, and the Department of the Treasury.

The work NASA does with these agencies ranges from Earth observations to law enforcement, from improved weather satellites to quieter jet engines.

In the field of international cooperation NASA has conducted 18 cooperative satellite and joint space probe projects. It has also flown 25 international experiments on its spacecraft. Since its early development of communications satellites, NASA has successfully orbited 12 spacecraft which form a system of global communications called Intelsat. 1975 will be the year of the Apollo Soyuz Test Project in which the U.S. and the USSR will fly a joint manned mission.

Looking ahead, I think people will take even more for granted the exploration of space and all of the spinoffs from it than they do now. The regular flights of the Space Shuttle will contribute to this attitude.

It is difficult to forecast the benefits that will flow from research. We nearly always underestimate the future -- scientists do this especially. I am sure we will be doing things that we've never even thought of.

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